Bridge 4759
Carrying Trunk Highway 20 over the Cannon River
Cannon Falls
Goodhue County
Minnesota

HAER No. MN-85

HAER
MINN
25-CANFA
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

HAER
MINN
25-CANFS
1-

HISTORIC AMERICAN ENGINEERING RECORD

BRIDGE 4759

Location:	Spanning Cannon River at State Trunk Highway 20, Cannon Falls, Goodhue County, Minnesota
UTM Quad:	Cannon Falls, Minnesota (7.5 minute series)
UTM Coordinates:	15:507410:4928580
Date of Construction:	1928
Present Owner:	Minnesota Department of Transportation 345 Kellogg Boulevard, Saint Paul, Minnesota 55155
Present Use:	Vehicular Highway Bridge
Significance:	Bridge 4759 consists of three 80-foot Warren pony trusses with polygonal top chords. It was erected in 1928 by the Guaranty Construction Company, a Minneapolis contractor, as part of a project to upgrade Trunk Highway 20, which had been incorporated into one of Minnesota's first federal highway routes. The bridge served for decades as a major gateway to downtown Cannon Falls, a trade center for the surrounding rural area. The polygonal Warren truss is the last of a long progression of popular pony truss designs that evolved during the nineteenth and early twentieth centuries. Once a common standard plan, this truss type is rapidly disappearing as bridges are replaced due to structural and functional obsolescence.
Historians:	Charlene K. Roise and Chad J. Perkins Hess, Roise and Company, Minneapolis, Minnesota October 1995

Description

Bridge 4759 carries State Trunk Highway 20 over the Cannon River, just north of the downtown commercial district of the city of Cannon Falls in Goodhue County. Goodhue County is located in the southeastern quarter of Minnesota. T.H. 20 is above the level of the flood plain of the Cannon and Little Cannon Rivers, which merge just to the east. The low-lying land adjacent to the road is used as a city park. Continuing to the south, T.H. 20 crosses the Little Cannon River on Bridge 4760. Both bridges have been determined eligible for the National Register. Since both were important components of the same highway improvement project, this report will include references to Bridge 4760 in discussing the construction history of Bridge 4759. The bridges are oriented on a slightly northwest-southeast angle; for the sake of clarity, the following description assumes that they run on a north-south axis.[1]

Bridge 4759 consists of three steel, five-panel, riveted Warren pony trusses. Each 80-foot-long truss has a polygonal top chord. The trusses are supported midstream by two pairs of concrete and steel columns. On each bank, the spans are supplemented by concrete deck-girder approaches that are incorporated into the substructure. These approaches extend the total bridge length to 241.5 feet.

The upper chord and inclined end posts of each truss consist of two channels tied by a cover plate and lacing. Two pairs of angles linked by battens make up the lower chord. For the verticals, two paired angles with lacing (located at panel points) alternate with two angles tied by battens. Several configurations are used for diagonals: two pairs of angles with battens, two angles with battens, and two angles with lacing. Rocker bearings on the south end allow for expansion. The truss rests on U-shaped concrete abutments. Back and wing walls and the bridge deck are also made of concrete. Rolled I-beams serve as stringers and floor beams. Bottom lateral bracing is provided by angles.

The bridge roadway is 30 feet wide. A sidewalk, measuring 6.2 feet in width, is cantilevered beyond the trusses on the west side of the roadway. A lattice railing along the outer edge of the sidewalk is supported by angle posts. The railings end at solid concrete parapet walls with recessed panels, which flank the approaches. Plaques set into the southeast and northwest parapets read "Minnesota Highway Dept. Bridge No. 4759 1928." Armco guard rails have been attached to the parapets and edge the road beyond the bridge.[2]

---

[1] Information for the following description was supplied by a field inspection by Chad Perkins on 5 December 1994; and by information provided by the Minnesota Department of Transportation, including original bridge plans, bridge maintenance records, and a structure inventory form dated 4 August 1992. The bridge is located in the northeast quarter of Section 18, Township 112N, Range 17W.

[2] Bridge 4760, a single-span structure, features the same truss design.

Maintenance records and field inspection verify that Bridge 4759 has been subjected to little alteration. Other than standard painting and repair, the only change appears to be the addition of Armco guard rail at the approaches.

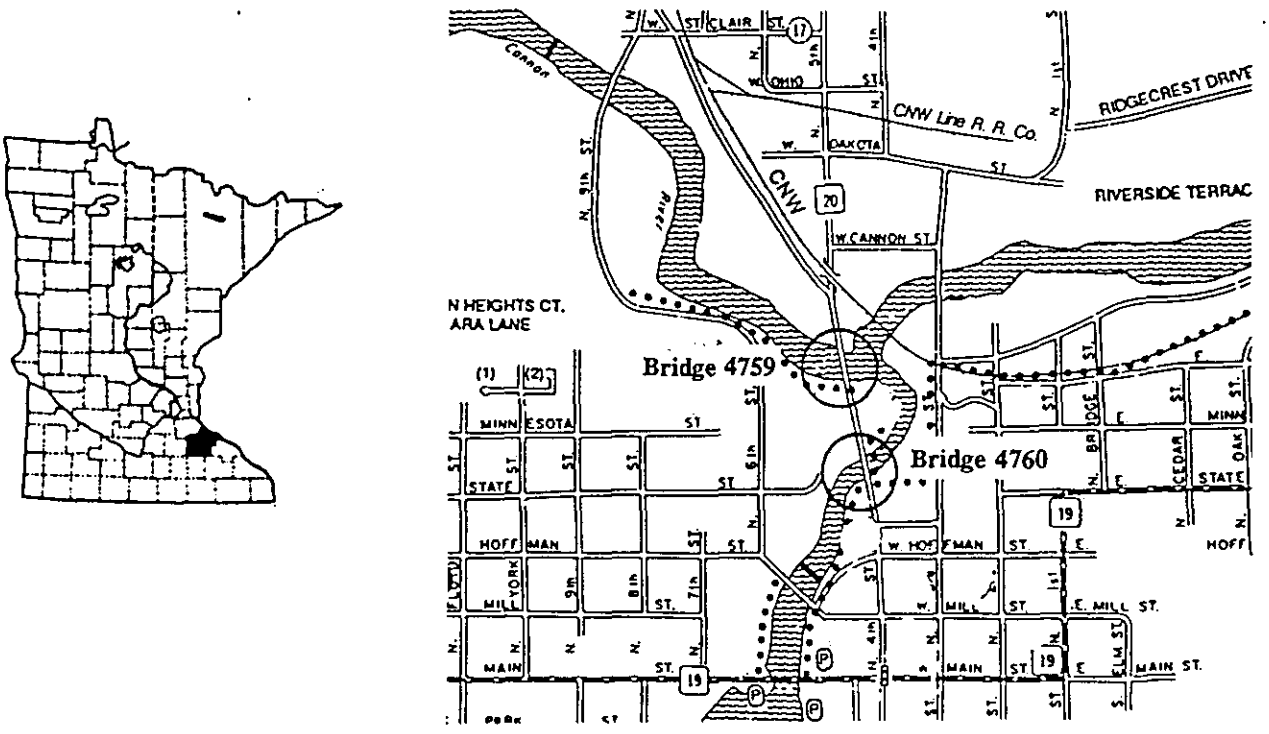

Figure 1 *Goodhue County is highlighted on the map of Minnesota. The other map shows the Cannon River flowing from west to east; the Little Cannon River approaches from the south.*

Bridging the Cannon River: A History

As the name suggests, Cannon Falls is situated at a drop in the Cannon and Little Cannon Rivers, which merge just north of the original town site. The water level of the larger river is controlled by the dam at Lake Byllesby a few miles upstream, where water was impounded for hydroelectricity generation in 1911.[3] From Cannon Falls, the river proceeds in an easterly

[3] Jeffrey A. Hess, "Hydroelectric Generating Facilities in Minnesota, 1881-1928," National Register of Historic Places Multiple Property Documentation Form, prepared for the State Historic Preservation Office, Minnesota Historical Society, Saint Paul, 1989.

direction to Red Wing, where it empties into the Mississippi River.

Soon after the Treaty of Mendota opened the region for Euro-American occupation in 1851, two important overland routes were established that intersected in the vicinity of Cannon Falls. One was a north-south stage road between Saint Paul and Dubuque, Iowa, which also passed through Rochester and near Zumbrota.[4] The other was a road between Red Wing and Fort Ridgely, authorized by the territorial legislature in 1854, which appears to have traversed Cannon Falls near the present path of State Highway 19. This was significant as one of the only major east-west routes in the area, since most early roads radiated from the burgeoning Minneapolis-Saint Paul metropolitan area.[5]

Cannon Falls was founded in 1854 and incorporated as a village in 1874. During the last half of the nineteenth century, it became a regional leader in flour milling and a trade center for the surrounding farm area. The community's rivers, which the mills utilized for waterpower, were otherwise an obstacle to commerce. Bridges quickly became a priority. The Little Cannon River witnessed a series of bridges at Main Street and between Mill and Sixth Streets, connecting the downtown business district with settlement to the west. Two bridges were erected over the Cannon River in 1874, but both were soon damaged by floods and traffic. One, located near a mill northwest of town, was replaced by an iron bridge in 1882. This was succeeded, in turn, by a two-span concrete-girder bridge in 1919. For many decades, this was the primary crossing into town from the north. Travelers on this route were required to go over the Little Cannon, as well, to reach downtown. The other 1874-vintage bridge, which was downstream from the intersection of the Cannon and Little Cannon Rivers, was followed by a combination wood-iron bridge in 1889 and, in 1909, a 180-foot steel span on Third Street. While this bridge was nearer to downtown than the other Cannon crossing, it was not easily reached by a through route. In addition, it did not connect directly with Fourth Street, which held the main concentration of downtown commercial activity. There was no good link to the north until construction of Bridges 4759 and 4760 in 1928.[6]

These bridges were part of a larger improvement plan for State Trunk Highway 20, which approached Cannon Falls from the northeast and continued south to Rochester, as well as State Trunk Highway 50, which extended northwest from Cannon Falls to the Twin Cities metropolitan area. In 1925, these roads had been included as part of U.S. Route 55, which

---

[4] References are to communities in Minnesota, unless otherwise indicated.

[5] Arthur J. Larsen, "Roads and Trails in the Minnesota Triangle, 1849-1860," *Minnesota History* 11 (1930): 391, 393-394, 402.

[6] Jeannette Burch, "Growing Pains of the Village and City," in *Chronicles of Cannon Falls 1976*, ed. Bicentennial Heritage Committee (Cannon Falls, MN: Cannon Falls Beacon, 1976), 35-36; Connie Bickman, "CF was Frequented by Wagon Trains," *Cannon Falls Beacon*, 9 October 1986, 32.

connected Minneapolis and Decorah, Iowa, via Rochester and Preston. Highway 55 was one of the first fourteen federal routes delineated in Minnesota. These routes were selected, according to the highway department's biennial report, because they "carry a heavy interstate traffic." The state bought and installed markers along these roads, which retained their state highway numbering as well. By 1927, Route 20 south of Cannon Falls, and Route 50 to the northwest, had been redesignated as U.S. Highway 52.[7]

The highway originally crossed the two-span concrete-girder bridge northwest of Cannon Falls.

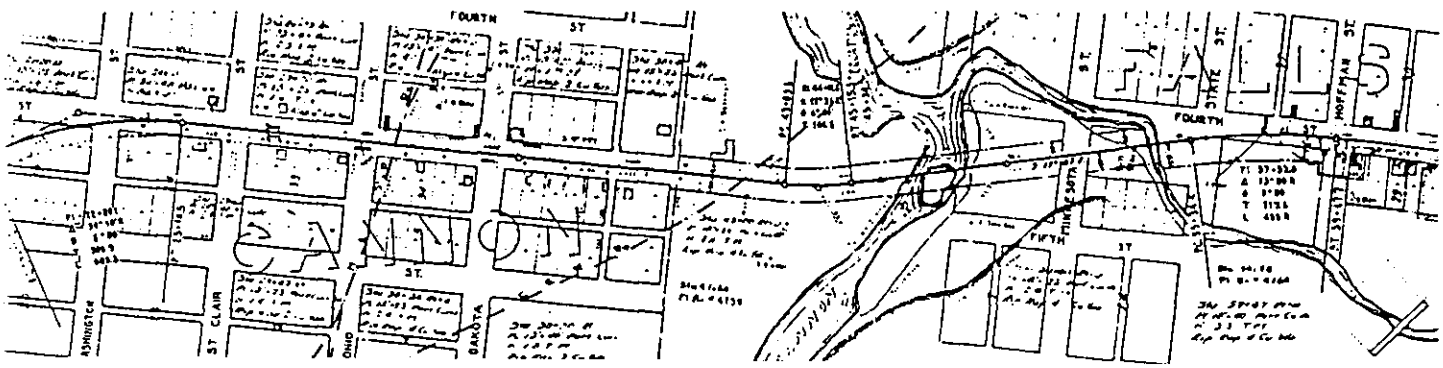

Figure 2 *From "Construction Plan for Trunk Highway No. 52 - 20 between Pine Island and Cannon Falls," prepared by the Minnesota Highway Department, approved 15 October 1927. North is to the left; the top of the map is east.*

In October 1927, construction plans were approved for realigning and paving the route from Cannon Falls to Pine Island, about 27 miles to the south. North Fifth Street was appropriated north of the Cannon River for the upgraded route. The road curved gently to the east as it passed over the Cannon and Little Cannon Rivers, then connected with Fourth Street to the south. Plans for the associated bridges, which were developed by the Minnesota Highway Department, were approved 10 April 1928. Shortly thereafter, contracts were awarded for "State Project 20-34." The letting consisted of four bridges and three culverts. The largest award went to the Guaranty Construction Company, 416 Essex Building, Minneapolis, for Bridges 4759 and 4760 in Cannon Falls. The bids were $36,374 for the three-span bridge, Number 4759, and $20,805 for the other, single-span structure. The culvert contract went to

---

[7] *Biennial Report of the Commissioner of Highways of Minnesota for 1925-1926*, 16-17; Bickman, "CF was Frequented by Wagon Trains," *Cannon Falls Beacon*, 9 October 1986, 32; Minnesota Highway Department, "Construction Plans for Trunk Highway No. 52 - 20," approved 15 October 1927.

Minnesota General Contractors of Minneapolis. Bridge 4763, a 140-foot through truss over the Zumbro River, was awarded to the Jensen Construction Company for $28,000. Arnold Ische of Norwood, Minnesota, was hired to build Bridge 4761, a 45-foot span. Sections of the route to Pine Island were paved over several construction seasons, and finally completed in 1930.[8]

A copy of the Guaranty Construction Company's letterhead from 1931 identifies the firm as "bridge contractors and engineers." It notes that the company was established in 1917, and includes the names of Grant Montgomery and E. J. Miller, presumably the company's principals. According to Minneapolis city directories, the Guaranty Construction Company had an office at the Palace Building in 1917 and 1918. For over a decade thereafter, the company is not listed in city directories. Grant Montgomery, however, is identified as a bridge contractor during the 1920s with offices at various locations in the Essex Building. The Guaranty Construction Company reappears in city directories between 1930 and 1933. According to the directories, Guaranty remained at 416 Essex Building from 1930 through 1933. After that, there is no mention of Guaranty or Montgomery. Montgomery, like many others who became bridge contractors, might have gotten his start working for another company: Minneapolis directories list "Lee and Montgomery" as agents for the Iowa Bridge Company in 1914 and 1915.[9]

A study prepared by Robert Frame in 1985 identifies five through-truss bridges credited to Guaranty. Two of the bridges were built in 1924 over the Sauk River in Stearns County. Another from the following year crosses the Crow River in Wright County. These bridges were modest single spans ranging in length from 100 to 140 feet. The company erected a more substantial structure in Le Sueur County, consisting of three 120-foot spans over the Minnesota River, in 1929. Finally, in 1930, the company produced a 140-foot bridge over the South Branch of the Zumbro River in Olmsted County. These construction dates indicate that Montgomery used the company's name through the 1920s, even though Guaranty didn't appear in city directories. Otherwise, little is known about the company or its founders.[10]

The route through Cannon Falls became increasingly snarled by growing traffic in the decades after World War II. By the mid-1960s, most of Highway 52 between the Twin Cities and Rochester had been upgraded to a four-lane route. It came as little surprise when, in 1966, a

---

[8] "Contracts Awarded," *The Improvement Bulletin*, 5 May 1928, 34; photocopy of Minnesota Highway Department bridge list, in Hess Roise files; *Biennial Report of the Commissioner of Highways of Minnesota for 1929-1930* (Syndicate Printing Co., 1931), 9.

[9] Grant Montgomery, Guaranty Construction Company, to Mr. Hoffman, Minnesota Highway Department, 7 August 1931; photocopy of typed letter in Hess Roise files.

[10] Robert M. Frame, "Historic Bridge Project: A Report," prepared for the State Preservation Office of the Minnesota Historical Society and the Minnesota Department of Transportation, Saint Paul, 1985, 77; Minnesota Highway Department bridge list.

4.5-mile, four-lane bypass was installed west of Cannon Falls at a cost of $2.25 million. Underscoring the importance of road visibility to commerce, a shopping mall was developed along the Highway 52 bypass in 1976, following a classic "suburban" development pattern.[11] Highway 20 reverted to serving primarily local traffic.

By this time, however, the significance of Bridges 4759 and 4760 to the area's history was well-established. It had, in fact, been acknowledged even before construction commenced: the concrete parapet walls by the approaches, more decorative than the standard railing design, befitted the bridges' role as a gateway to the city. In addition, the bridges date from a period when the automobile became firmly entrenched as America's primary means of transportation. Built to upgrade one of the first federal interstate routes designated in the state, the bridges were an important link in the region's transportation network. The highway department's 1927-1928 biennial report notes that "very material relief has been afforded to the traffic entering the Twin Cities by the completion of the paving" on several trunk highways, including "No. 50 from Cannon Falls to Farmington."[12] Bridges 4759 and 4760 were an major improvement at the southern end of this conduit.

In terms of engineering, the polygonal Warren truss represents the last in a long progression of common pony truss designs. Pony trusses were the bridge of choice for mid-length spans in the late nineteenth and early twentieth centuries, a period of prolific bridge construction in the region. Specifications issued by the Minnesota Highway Department in 1912 recommended riveted Warren ponies for 60- to 80-foot spans; ponies or plate girders were acceptable for 45- to 60-foot bridges. By 1918, riveted Warren ponies were preferred for all 40- to 80-foot spans. The polygonal top chord became popular in the 1920s as a way to reduce dead load and save on the cost of materials. The disadvantages of truss bridges, however, grew increasingly apparent during this period. The bridges were expensive to build and difficult to widen. Truss leaves obstructed drivers' sight lines. Many considered the trusses ugly. By the late 1920s, steel mills developed technology to roll deeper webbed I-beams, which could span greater lengths. Engineers were also becoming more proficient at designing continuous and cantilevered structures. As a result, stringer and girder bridges virtually supplanted pony trusses by the late 1930s.[13]

The highway department apparently introduced the polygonal Warren pony in the late 1920s. The department's 1925-1926 biennial report notes that "there have been no substantial changes

---

[11] Bickman, "CF was Frequented by Wagon Trains" and "Highway Bypass Made Big News 20 Years Ago," *Cannon Falls Beacon*, 9 October 1986, 32.

[12] *Biennial Report of the Commissioner of Highways of Minnesota for 1927-1928*, 10.

[13] Charlene K. Roise, Robert M. Frame, and Jeffrey A. Hess, "The Preservation of Historic Bridges in Minnesota: A Strategic Plan," prepared for Hess, Roise and Company, Minneapolis, Minnesota, 1990, 8-10.

in bridge design and construction work during the past two year period." It adds that "efforts are continually being made to incorporate new ideas or changes suggested by observations in the field, such as the need of higher curbs, stronger railings, additional provision for drainage, improved concrete construction on the job, etc." Mention of structural design is noticeably absent. The report includes photographs of 75-foot Warren pony truss bridges with concrete parapet walls similar to the Cannon Falls bridges, but with straight top chords. This suggests that the polygonal top chord design was not in use during the biennium. The following biennial report observes that "there have been no substantial changes in our **departmental methods** of bridge design" (emphasis added), but makes no reference to actual design. It seems possible, therefore, that the 1928-vintage Cannon Falls bridges are among the first polygonal Warren pony trusses produced by the highway department. In any event, they are now the oldest extant examples of this type.[14]

They are also among only fourteen polygonal Warren pony truss bridges remaining in the state. The total number of bridges built from this standard highway department plan is not known, but the design was presumably relatively common in the late 1920s and the 1930s. Spans of the surviving polygonal Warrens range from 75 to 97 feet in length. While the 80-foot spans of the Cannon Falls bridges are not exceptional, Bridge 4759 is distinguished as the only extant multiple-span structure of this type. The other thirteen bridges have only single spans.[15] While the introduction of the polygonal Warren pony truss did not present outstanding technological challenges, this design deserves recognition as a standard plan during an important period in the highway system's evolution. Once common, the design is rapidly disappearing from Minnesota's highways under continuing pressure to upgrade the system's capacity.

Such is the fate of Bridge 4759, which the Minnesota Department of Transportation plans to replace. The project required a permit from the U.S. Army Corps of Engineers, triggering a review under Section 106 of the National Historic Preservation Act of 1966. Reconnaissance-level surveys of the project's area of potential effect were completed in 1992 and 1994 by the Trunk Highway Cultural Resources Program of the Minnesota Historical Society. No archaeological properties were found to be affected by the project. Sixteen historic properties were analyzed, including buildings, bridges, and parks. Only two of these properties, Bridges 4759 and 4760, were judged to merit further study for potential National Register designation. In September 1994, the State Historic Preservation Office concurred with this conclusion. In November of that year, the Department of Transportation retained Hess, Roise and Company to undertake an assessment of the National Register potential of the bridges. Research historian Chad Perkins completed archival research and field work, and principal Charlene Roise prepared

---

[14] *Biennial Report of the Commissioner of Highways of Minnesota for 1925-1926* (Minneapolis: Syndicate Printing Co., 1927), 10-12, and *Biennial Report of the Commissioner of Highways of Minnesota for 1927-1928*, 17.

[15] Information on polygonal Warren pony bridges was obtained from the bridge database and bridge files maintained by the Minnesota Department of Transportation at the Office of Bridges and Structures, Roseville.

the final report, which concluded that Bridge 4759 was eligible under Criteria A and C, and Bridge 4760 under Criterion A. Since the removal of Bridges 4759 and 4760 constituted an adverse effect under Section 9(1) of 36 CFR Part 800, a Memorandum of Agreement was developed between the Corps of Engineers, the Minnesota Department of Transportation, and the Minnesota State Historic Preservation Office. One of the stipulations called for HAER documentation of Bridge 4759, which has been met by the submittal of this report.

Plans : were prepared by the Minnesota Highway Commission in 1928. Copies are available from the Minnesota Department of Transportation's Office of Bridges and Structures.

Sources Consulted

Published Sources

Bickman, Connie. "CF was Frequented by Wagon Trains." *Cannon Falls Beacon*, 9 October 1986, 32.

_____. "Highway Bypass Made Big News 20 Years Ago." *Cannon Falls Beacon*, 9 October 1986, 32.

Biennial Report of the Commissioner of Highways of Minnesota for 1926-1927. Minneapolis: Syndicate Printing Company, 1927.

Biennial Report of the Commissioner of Highways of Minnesota for 1927-1928. Minneapolis: Syndicate Printing Company, 1929.

Biennial Report of the Commissioner of Highways of Minnesota for 1929-1930. Minneapolis: Syndicate Printing Company, 1931.

Burch, Jeannette. "Growing Pains of the Village and City." In *Chronicles of Cannon Falls 1976*, ed. Bicentennial Heritage Committee, 35-37. Cannon Falls, MN: Cannon Falls Beacon, 1976.

"Contracts Awarded." *The Improvement Bulletin*, 5 May 1928.

Larsen, Arthur J. "Roads and Trails in the Minnesota Triangle, 1849-1860." *Minnesota History* 11 (1930): 387-411.

Unpublished Sources

Frame, Robert M. "Historic Bridge Project: A Report." Prepared for the State Preservation Office of the Minnesota Historical Society and the Minnesota Department of Transportation, Saint Paul, 1985.

Hess, Jeffrey A. "Hydroelectric Generating Facilities in Minnesota, 1881-1928." National Register of Historic Places Multiple Property Documentation Form. Prepared for the State Historic Preservation Office, Minnesota Historical Society, Saint Paul, 1989.

Minnesota Department of Highways. Bridge list. Photocopy of handwritten log. Hess, Roise and Company files.

_____. Plans for Bridge 4759 and Bridge 4760, approved 10 April 1928; construction plans for Trunk Highway No. 52 - 20, approved 15 October 1927; various plans for other road improvements for Trunk Highway 20. Located at Minnesota Department of Transportation Headquarters, Saint Paul, and Office of Bridges and Structures, Roseville.

Minnesota Department of Transportation. Bridge maintenance files and database. Office of Bridges and Structures, Roseville, Minnesota.

_____. Structure inventory forms for Bridge 4759 and Bridge 4760, 4 August 1992. Office of Bridges and Structures, Roseville, Minnesota.

Montgomery, Grant, Guaranty Construction Company, to Mr. Hoffman, Minnesota Highway Department, 7 August 1931. Photocopy of typed letter. Hess, Roise and Company files.

Quivik, Frederic L., and Dale L. Martin. "Iron and Steel Bridges in Minnesota." National Register of Historic Places Multiple Property Documentation Form. Prepared for Renewable Technologies, Butte, Montana, 1988.

Roise, Charlene K., and Deanne L. Zibell. "Determination of Eligibility: Bridge Number 5257 and Bridge Number 23004, Fillmore County, Minnesota." Prepared for Hess, Roise and Company, 1992.

Roise, Charlene K., Robert M. Frame, and Jeffrey A. Hess. "The Preservation of Historic Bridges in Minnesota: A Strategic Plan." Prepared for Hess, Roise and Company, 1990.

Sluss, Jackie, Kent Skaar, Michael S. Edwards and Shawna Kruger. "Draft Phase I Cultural Resources Reconnaissance Survey Report." Prepared for the Trunk Highway Cultural Resources Program, Minnesota Historical Society, 1994. Funded and authorized by the Minnesota Department of Transportation and the Federal Highway Administration.